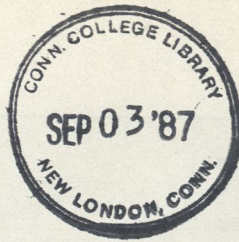


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Volume 15 Number 1 September 1987 \$5/yr.
The Connecticut Department of Environmental Protection

The DEP's Oil and Chemical Spills Section

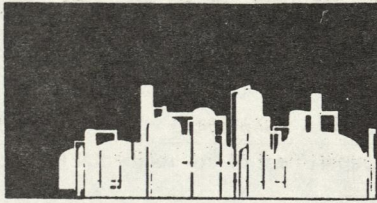


In the past and future modes,
we might have something like this:
"A study of traffic patterns on I-95,
correlating the transportation of
certain hazardous materials with
population density, indicates that
a certain number of accidents
involving toxic materials may be expected."
In real time this becomes:

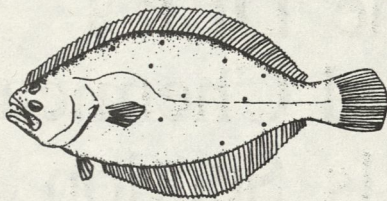
SCREECH
CRASH
GUSHHH

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Cover by Michael D. Klein

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Editor's Note

With this, the September issue, we begin another year of the *Citizens' Bulletin*. It looks to be an exciting and challenging year.

The big news is that we now have a new commissioner. We welcome Leslie Carothers to the DEP, and pledge our support in her efforts to carry on the great and important mission of keeping Connecticut clean, healthy, and beautiful. Congratulations, Commissioner. We're happy to have you here.

Readers may have noticed (we hope) that the Bulletin has reached them on time this month. This has not been by accident, but the result of a big push -- merciless deadlines, overworked staff, and skipped vacations. But, that's the kind of guys we are here. This year we *will* get this magazine to you on time.

A major addition to the magazine is "The Natural Historian," contributed by the staff of world-class scientists, researchers, and photographers at the State Museum of Natural History. The addition of this department should raise the level of the *Bulletin* yet another few notches. And, for a delightful, magical, and painlessly educational day, may we suggest a visit to the Museum itself. It's on the UConn campus in Storrs, and is another one of our state's well-kept secrets.

Alright. We're entering a new phase of things here. A lot of possibilities, new plans. And, as usual, we're not exactly sure what's around the corner. How do we handle that? As Bill Holden said to his buddies in *The Wild Bunch*, "Let's go."

R.P.



Events like this train collision in Wallingford are all in a day's work for the DEP's Emergency Response Team. In this accident, 4,000 gallons of diesel fuel spilled. (Photos: R. Paier)

On Real Time

In disaster situations, the Emergency Response Team gets the call

by
Robert Paier

Nobody is going to deny that the DEP, like every other bureaucratic organization, is heavily into moving papers around, getting them signed and counter-signed, nine-to-five desk work. That's the way things are, that's what makes the world go around. Yet, within the DEP, there exists a small, highly-select group of people who don't settle into the routine. They are people who feel a deep, insistent need to be "out there," at the edge.

"These guys are the special forces of our agency," says John W. Anderson, deputy commissioner of the DEP. "They are

"When the phone rings in the middle of the night, you are given precise instruction one time, and then good-bye."

Donald Burton

the first line of defense in any disaster situation." In the Army, they are the Green Berets; in the Navy, they are the SEALs; in the police department, they are the SWAT teams. They work on a level of intensity higher than most people feel comfortable with. Within the DEP's Hazardous Materials Management Unit, the Emergency Oil and Chemical Spill Section, operates at the edge of things. In this article, we'd like to take a look at that group, see what they do and how they do it, and why Connecticut is cleaner and safer because of them.

PEOPLE WHO WORK to preserve and protect the environment do so in a number of different temporal modes. There are those who take a historical perspective, analyzing data, identifying trends. Others address the future, planning strategies, setting long-term goals. And still others work in the "right now," on what is called "real time." For example, in the past and future modes, we might have something like this: "A study of traffic patterns on I-95, correlating the transportation of certain hazardous materials with population density, indicates that a certain number of accidents involving toxic materials may be expected." In real time, this becomes: "Screech/ Crash/ Gushhhh!"

THE DEP's EMERGENCY RESPONSE TEAM, under the authority of the Hazardous Materials Management Unit, operates in real time. The team's 10 field inspectors are available 24 hours a day, 365 days a year. They are each assigned a four-wheel-drive vehicle, which is loaded to the gills with state-of-the-art analysis, mitigation, and containment equipment. Anytime, anywhere in Connecticut there is an emergency situation involving the spill or leak of hazardous materials, the ERT goes to work. Not soon, not in a few minutes, but right now. On real time.

"When the phone rings in the middle of the night," says Team Leader Donald Burton, "you are given precise instructions one time, and then good bye. You have to be immediately 100 percent physically and mentally alert."

"We're the band-aid guys," says Charles Zieminski. "We go in fast and treat the gross symptoms. And, because every situation is different, and because we're operating on the edge of technology, we can't be afraid to try new things."

"The first few hours after a spill are critical," says William Hegener, director of the ERT. "If you can control it then, fine. If not, you will have a large problem on your hands."

HAZARDOUS SUBSTANCES are defined as those which, if improperly managed, can cause damage to the environment and public health. The threat may be immediate or delayed, and often involves danger to the quality of one of our most precious resources, clean drinking water.

Recognizing the need for a mechanism to respond to emergency situations involving hazardous materials, the Connecticut General Assembly, in 1971, mandated this responsibility to the DEP. The job then fell on a special unit, whose members had specialized training and expertise, were able to make quick and appropriate judgements in stressful situations, and were willing to go into action at any time.

According to a DEP directive, the Emergency Response Team provides the the following services: (1) clean-up and reduction of the impact of any incident involving the emergency release of hazardous materials; (2) determination of final responsibility for the incident, and the securing of financial commitments appropriate to the incident; (3) coordination with other agencies, such as the federal Environmental Protection Agency and the U.S. Coast Guard, which may be involved in responding to the incident; and (4) assistance in identifying materials in question, determining the nature of the health and safety hazards which might be expected, and deciding on proper control techniques.

While the Emergency Response Team employs the latest and most efficient technology available, it is important to understand, however, that no matter what methods are used, there is nothing that will clean up everything. As Field Inspector James Santacroce noted, "There is no magic filter."

"There is no magic filter."

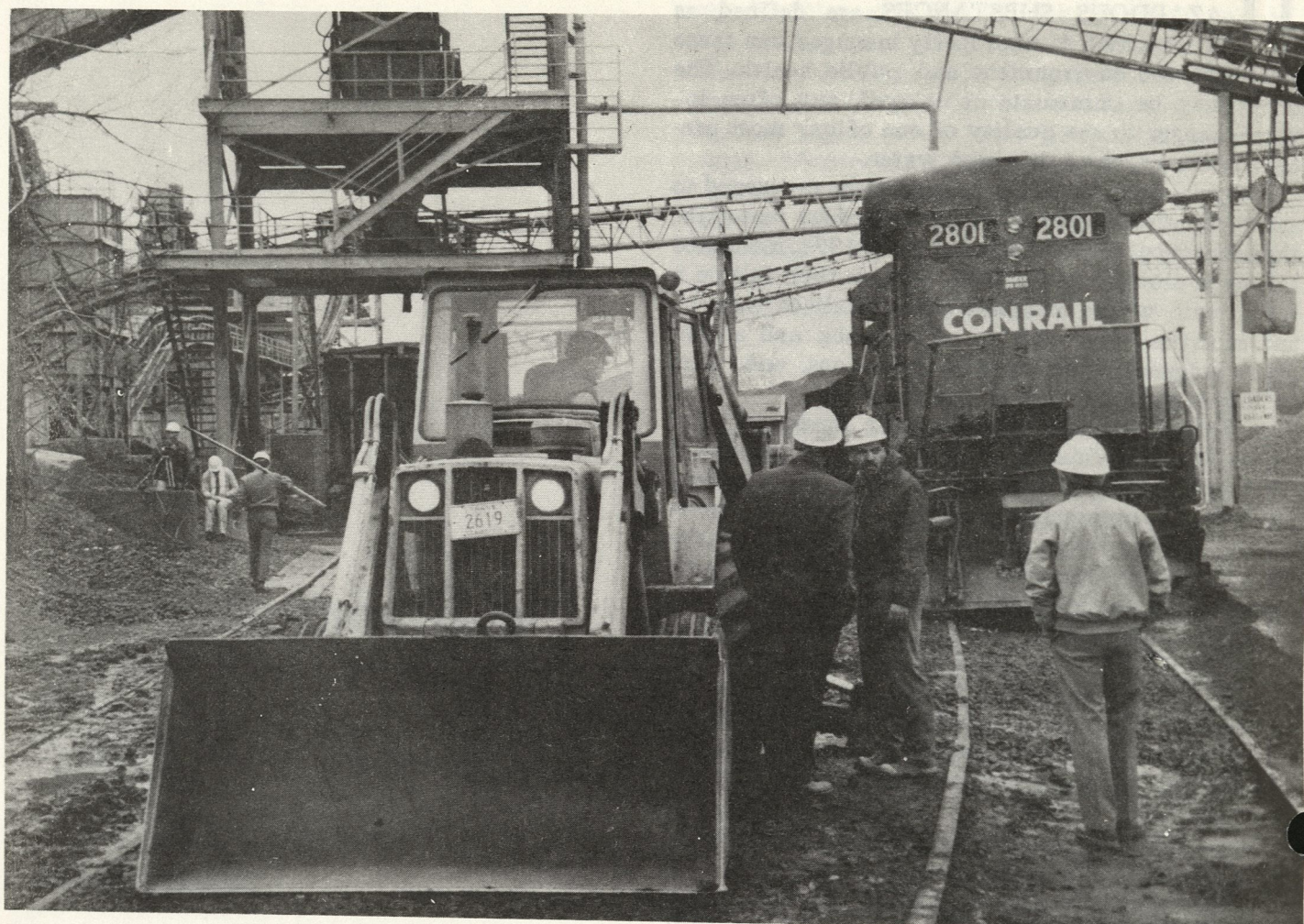
James Santacroce

IN ORDER TO GET A SENSE OF THE TASK of the ERT, an understanding of the equipment they use is helpful.

A "boom," or floating containment barrier, is often used when spills occur on open water. This device is designed with a buoyant or flat surface affixed to a floating collar, and held in position with ballast. The boom may contain floating contaminants by surrounding them, restricting them along a shoreline, or deflecting them to areas where they may be more easily removed. The sorbent boom, or "sausage," is able to absorb floating petroleum liquids.

On some occasions, floating, water-repellent, oil-absorbent materials are used to physically pick up oil from waterways. These may range from sophisticated man-made materials to specially treated corn cobs.

A filter fence is usually employed in quiet areas of streams or along calm river coves to contain or prevent oil from entering the waterway. Behind the



Field Inspector James Santacroce directs clean-up operations. At any given time, the ERT is monitoring 10 to 20 active spills.

fence is placed well-shaken hay or, more commonly, sausage boom.

A vacuum tank truck is used to remove contaminant from the ground or water surface. An oil-water mix can be loaded onto this truck, allowed to settle, and then be dewatered. When the truck is full of clean oil, the load is transferred to a conventional tanker for transportation to a storage site.

There are, however, instances when vacuum trucks should not be used, as when extremely volatile liquids are involved in an accident. Vapor pressure inside a vacuum tank can be low enough to cause some liquids to boil, leading to the possibility of a fire or explosion.

Skimmers are devices used primarily with vacuum equipment to maximize the amount of floating oil removed from the water by reducing the amount of water sucked up along with oil.

Finally, hydro-lasers, or high-pressure washers, are used to remove oil from hard-to-get areas, porous areas, or to remove heavy residual oils from areas of difficult access. These devices operate with very high nozzle pressures, and can be extremely dangerous. Pressures great enough to remove the outer faces of rock occur.

DEPENDING on where an accident occurs, different techniques and strategies are employed.

When the accident occurs on open water, such as on large rivers, harbors, or in Long Island Sound, an oil containment boom is often used. This device allows the oil or chemical to be contained or redirected, while allowing water to pass freely underneath it. When a spill occurs on open water from a bulk vessel, the usual strategy is to encircle the leaking vessel with a boom. This often involves several hundred feet of boom, which must be delivered to the site, deployed, and towed to the spill area. Often smaller boats are used in deploying the boom.

It should be clear that the operations involved here can entail a lot of danger, as they may occur at night, or in extreme weather conditions. Also, the action of the tide must be understood and compensated for.

Once the oil is contained, it must be removed. This is often done by means of a skimming vessel, which picks up the oil or debris by means of a conveyor belt, or an adjustable weir system, as it moves forward on the water.

Finally, and often overlooked, is the ultimate problem of disposing of the materials which have been picked up. This aspect of the operation can be more time-consuming than any other. While the ERT usually does not get involved in this, their ability to act quickly and correctly will minimize the total amount of waste which must be disposed of.

WHILE MOST OF THE SPILLS in open water involve fuel oils or motor fuels, those which occur in the smaller waterways can be almost any oil, fuel, chemical, or other material. The most frequent sources of these spills are vehicle accidents, or discharges from industrial, commercial, or governmental facilities.

The tools most often used in spills on smaller waterways are the filter fence, mini-boom, and boom. When standard equipment is not immediately available, however, time can be bought by laying a log or board across the stream, and backing it up with loose leaves. An old mattress made of foam rubber may be cut in strips which are then tied end-to-end, and can be used as a sorbent boom. And finally, sand can be used to dike very small streams and ditches.

EACH YEAR, THE DEP RESPONDS to hundreds of reports of spills involving sanitary sewers or storm drainage systems, which are primary paths by which spilled materials may enter waterways. In the past, even fire departments flushed any spilled materials into the nearest drain. We now understand that the problem does not end here. Out of sight doesn't mean out of mind, but out of control.

When spilled material gets into a catch basin or storm sewer, an environment is created where trapped fumes are allowed to collect. One cup of gasoline, for example, which is completely vaporized and confined in a small area has as much explosive power as nine sticks of dynamite.

According to the Oil and Chemical Spill Section, the most common sources of sanitary sewer problems are illegal industrial discharges and leaking underground storage tanks.

Almost all spills, with the possible exception of those which occur in deep water, impact the ground in some manner. Surface spills, which involve removal of topsoil to dispose of contaminants, may require a lot of work, but are clear-cut and straightforward. Subsurface spills, on the other hand, spills which percolate to subsurface waters, constitute a major problem and serious danger. In a state where 60 percent of the residents depend on groundwater supplies for their daily drinking water, the threat of groundwater contamination represents the greatest possible danger.

Ground and groundwater contamination by petroleum products or chemicals can be serious and very long-lived. A major incident will require a lot of time and money to correct. However, it must be remembered that even the most extensive recovery operation will not recreate the quality of resources which existed prior to the spill. Only time and nature may be able to do that.

THE KEY WORD in Emergency Response Team is, of course, "team." According to Director William Hegener, "There are 12 people on this team, 10 in the field, and two in the office, whose job is to coordinate communications. The reason the unit works well is that they are able to work together, to complement each other.

"At any given time in Connecticut, we are monitoring from 10 to 20 spills. In order to keep an assignment like that under control, our people must function as a team."

"Our people are dedicated and self-motivated," says Donald Burton. "They must be able to handle things under stress conditions, when people are confused and under pressure, and when large sums of money may be involved. The money factor comes not only from loss of product, but also from the cost of cleaning up. A delicate, diplomatic approach is required."

Generally, those responsible for a spill will comply with requests from the ERT. If, under emergency conditions, a request to finance a cleanup is refused, the state will commit sufficient funds to get the job done right away. If, at a later time, responsibility is proved, then the state bills at a rate of 150 percent of the costs

incurred, plus any direct costs, such as personnel salaries and overtime.

ON THIS JOB, EVERY DAY IS DIFFERENT," says Bill Hegener. On April 24 of this year, Field Inspector James Santacroce's day involved the investigation of a train collision in Wallingford. The accident occurred on the grounds of Tilcon-Tomasso, a mining and asphalt company. Fortunately, there was no personal injury, but there was a spill of approximately 4,000 gallons of diesel fuel.

Santacroce was called to the scene. He determined the extent of the damage caused by the spill. One concern was that the fuel would seep underground and contaminate a nearby wetland. Santacroce concluded that a small amount of fuel did in fact find its way into the company's water system. This, however, was isolated and contained. Santacroce arranged for clean-up services from a local company.

It was very apparent that all efforts were being made by the parties responsible to behave conscientiously, to minimize environmental damage, and to do the right thing. It was also clear, however, that the

presence of a DEP inspector tended to facilitate matters. Santacroce's response to this observation was the knowing smile that comes from a lot of experience. "Even the most environmentally conscious people tend to get less conscientious," he said, "when money is involved."

STEPHEN HITCHCOCK IS THE DIRECTOR of the DEP's Hazardous Materials Management Unit, and is ultimately responsible for the ERT. He expressed pride in his team of elite troops. "The ERT in Connecticut responds to more calls, per man, than any other similar unit in New England," said Hitchcock. "We have received many thank-you notes from people who have appreciated this team's fast response and expert handling of dangerous situations."

Finally, Deputy Commissioner John Anderson summed it up: "It takes a special and unique kind of dedication to go into a dangerous situation where you may not always know exactly what you're dealing with. I think 'proud' and 'grateful' are two words that describe how we feel about the Emergency Response Team."



While the ERT uses sophisticated clean-up equipment, it should be remembered that there is nothing that cleans up everything.

Enter the Timberdoodle

THE AMERICAN WOODCOCK (*Philohela minor*), also known as "timberdoodle," is a bird of the forest, despite being classified in the sandpiper family. It is a short, plump bird, about the size of a fist, with a 2.5-inch-long bill. Its large eyes are set high and far back on the head for increased peripheral vision. The wings are short, wide, and rounded to facilitate flying in dense cover. The back is a mottled brown (resembling a "dead-leaf pattern") which provides excellent camouflage against the forest floor. The top of the head is black with tan crossbars and the underparts are an orange-tan color. Sexes are similar in appearance, but the female woodcock is slightly larger than the male.

The woodcock's range is primarily eastern North America, from southern Canada to the Gulf states; the birds breed in the northern part of their range and migrate south in the winter.

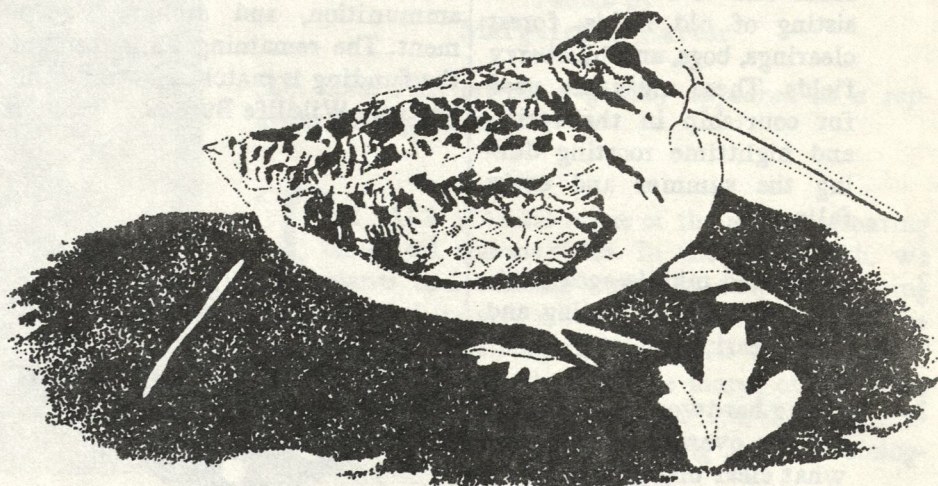
IN LATE JANUARY and February, woodcocks begin migrating north, arriving in the Northeast from mid-March to early April to begin courtship and breeding. Shortly after their arrival, males begin performing courtship flights at dusk in forest openings called "singing grounds." The display consists of a series of spiralling flights

interspersed with ground-strutting, during which the male utters a nasal "peent" repeatedly. Each evening's activities may last from 30 to 60 minutes, with from 10 to 20 flights.

Male woodcocks may mate with several females; nesting begins in April and May. The nest, a shallow depression lined with leaves, is usually located less than 100 yards from the singing ground. Young, second-growth hardwood stands are the preferred nesting habitat. Four brown, pink, and gray mottled eggs are laid and incubated for from 19 to 22 days, usually hatching sometime in May. The females remain

close to the nest, relying on their protective coloration; they flush only when almost touched. The young leave the nest one day after hatching and follow the female throughout the feeding area. Fully feathered and capable of flying at two weeks of age, the growing young woodcocks mature quickly and appear almost full-grown at four weeks. They tend to remain in the nesting area until the fall migration begins in October.

During the summer months, woodcocks are primarily active during the daylight hours, feeding and loafing in pole-sized hardwood, hardwood-conifer, or alder stands.



The woodcock uses its long bill to probe the soil for earthworms and other food. (Illustrations by Ruth Billard)

These areas generally have dense overhead cover, fairly open ground cover for good visibility, and moist, fertile soil which supports earthworms. At dusk, the birds walk or fly to open fields or forest clearings where they roost on the ground.

About 70 percent of the woodcock's diet is earthworms. Other insect matter, including larvae, slugs, ants, beetles, moths, and grubs, comprise about 20 percent of the diet. The remaining 10 percent of the woodcock's diet consists of plant matter, such as seeds, sedge, foxtail, violet, alder, raspberry, blackberry, cinquefoil, ragweed, bedstraw, smartweed, elder, dogwood, and fern.

The woodcock uses its long bill to randomly probe the soil for earthworms and other food. The upper bill has tactile sensors and a flexible tip which allows the bird to find and grasp its food beneath the ground.

THE ABUNDANCE of woodcocks is related to the availability and quality of four habitat types:

1. Open areas, varying in size from 0.25 to 100 acres, consisting of old fields, forest clearings, bogs, and blueberry fields. These areas are used for courtship in the spring and nighttime roosting during the summer and early fall;
2. young and middle-aged hardwood stands for nesting and brood rearing;
3. young hardwood stands with a dense overstory and somewhat clear understory. These areas are used by both young and adult birds for feeding and loafing in the daytime;

4. alder swales and surrounding second-growth hardwood types on fertile moist soil, harboring an abundant supply of earthworms for feeding.

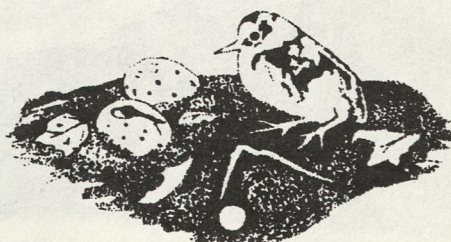
Woodcocks are particularly vulnerable to changes in habitat. The drainage of wetlands and natural plant succession can eliminate good woodcock habitat, forcing the birds to utilize marginal areas or move in search of new habitats.

References and Further Readings

Sheldon, W. G. 1967. *The book of the American woodcock*. Univ. of Mass. Press, Amherst.

Sepik, G.F., Owen, R.B. Jr., and Coulter, M.W. 1981. *A landowners guide to woodcock management in the Northeast*. Life Sci. and Agr. Exp. Sta., Univ. of Maine, Orono.

The Technical Assistance Informational Series in 75 percent funded by Federal Aid to Wildlife Restoration — the Pittman-Robertson (P-R) Program. The P-R Program provides funding through an excise tax on the sale of sporting firearms, ammunition, and archery equipment. The remaining 25 percent of the funding is matched by the Connecticut Wildlife Bureau.



The woodcock usually lays four eggs which hatch sometime in May.

Wildlife Listing

If you think you've seen just about every wild animal Connecticut has to offer, take a look at the recently-completed list of 424 vertebrate wildlife species produced by the Wildlife Bureau's Nongame Wildlife Program. You may be amazed that a state as small as ours could hold such an assortment of faunal life. This list details the common and scientific names of 304 birds, 52 terrestrial mammals, 21 marine mammals, 23 reptiles, and 24 amphibians. The wide variety of species present in Connecticut clearly reflects the need to conserve an equally diverse array of habitats to maintain healthy populations of these creatures.

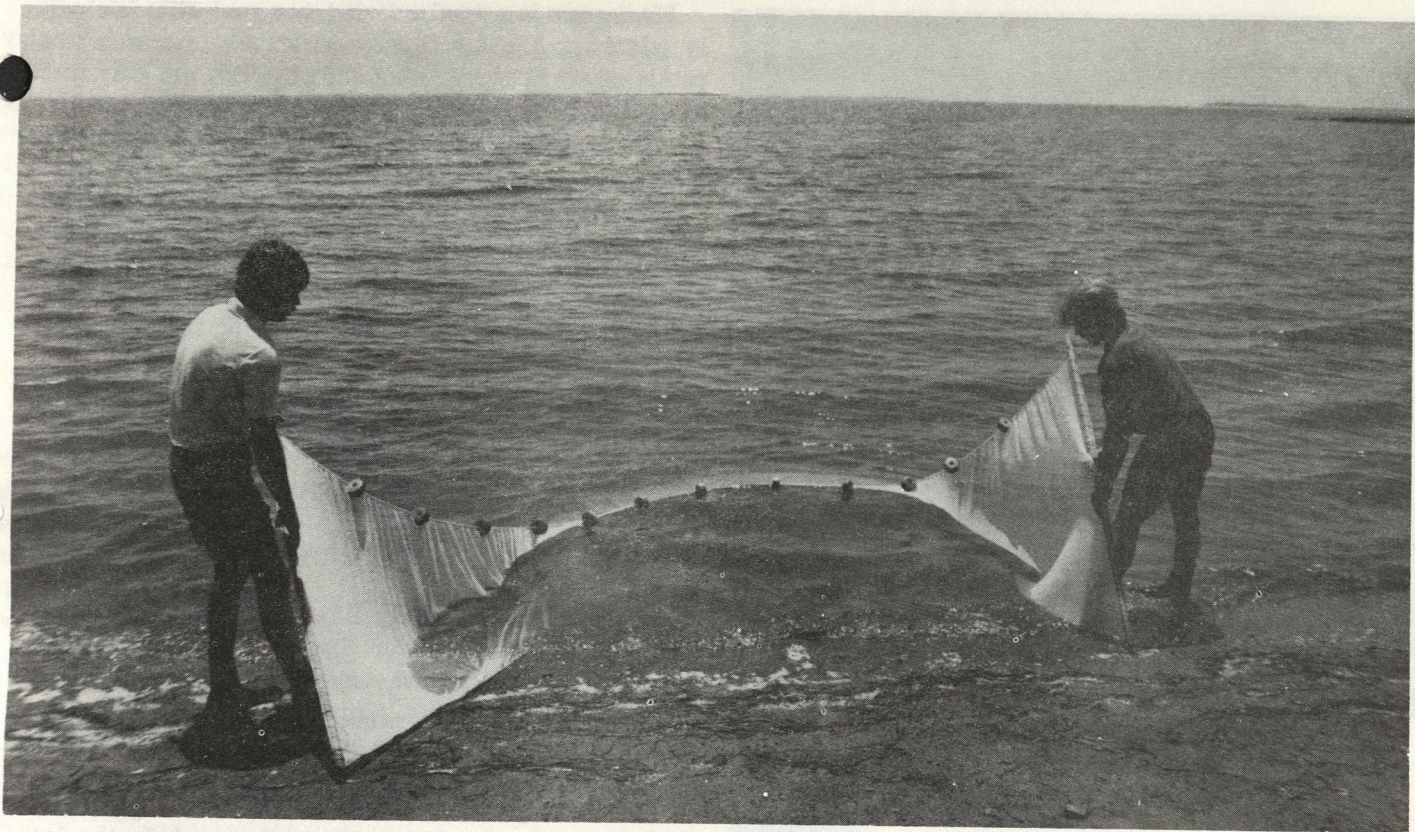
The list, published as a pocket-sized brochure, is entitled *Connecticut's Wildlife: A Checklist of Birds, Mammals, Reptiles, and Amphibians*. Space is provided for wildlife enthusiasts to "check-off" each species as it is sighted.

Funding to compile and publish this wildlife list was provided by **Public Act No. 86-370: An Act Establishing a Program for the Conservation of Nonharvested Wildlife**. Copies may be obtained, free-of-charge, by contacting the DEP Wildlife Bureau at the offices listed below:

Sessions Woods W.M.A.
P.O. Box 1238
Burlington, CT 06013
(203) 584-9830

Wildlife Bureau, Rm. 252
State Office Building
Hartford, CT 06106
(203) 566-4683

Franklin W.M.A.
RR 1, Box 241
North Franklin, CT 06254
(203) 642-7239



Aquarist Michael Johnson and his assistant William Gopirak, both from Mystic Marine Aquarium, prepare to examine some of the many life-forms at Barn Island Salt Marsh.

The Salt Marsh: An Ecological Treasure Trove

by

Judith Kay Anderson Silverberg

Photos by

Margaret A. Carter

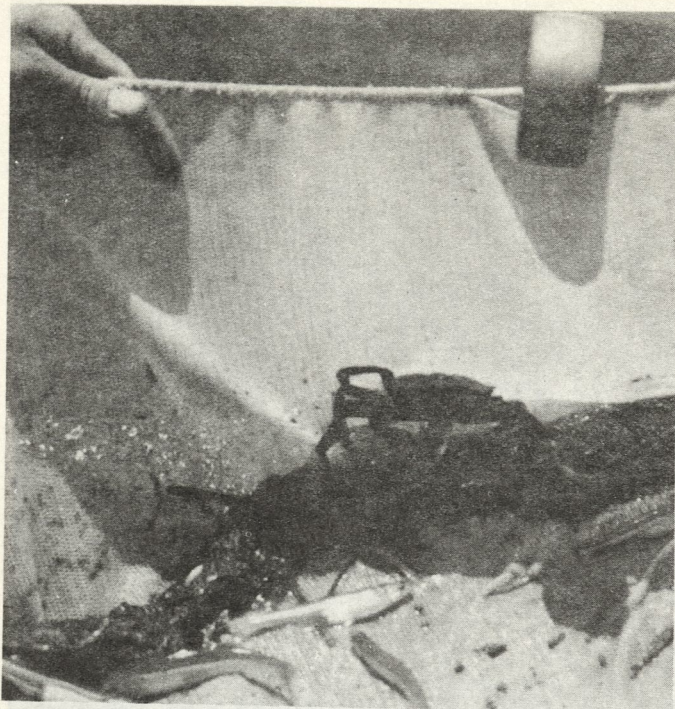
(Ed. note: This article originally appeared as a separate DEP publication.)



Salt marshes are among the most biologically productive areas in nature. Pictured here, a baby flounder.

THE SALT MARSH is one of the most fascinating biological communities. In the salt marsh, we find plants and animals uniquely adapted to being daily flooded by salt water and then exposed by the falling tides. The changing tide carries vegetable matter and marine animals from the marsh over a wide area of the sea, to be eaten by other fish, shellfish, and crustaceans. Salt marshes are among the most biologically productive areas in nature.

It takes thousands of years for a marsh to form and for the complex interrelationships of plant and animal life to develop. On the other hand, it takes



This green crab, even when struggling to escape capture, still found time to consume an unlucky silverside fish.

very little time to destroy a salt marsh. Since 1914, man — through filling, wastes disposal, industrial sites, housing developments, airports, and parking lots — has caused the destruction of over 50 percent of the marshland of Connecticut.

It is hoped this article will help the reader to understand, appreciate, and maybe even explore Connecticut's salt marshes.

SMOOTH CORDGRASS grows on the lower border of the salt marsh nearest the water at low tide. Erect stalks range from one to nine feet in height. Ducks and geese eat the rootstocks and seeds, while muskrats prefer only the rootstocks.

Saltmeadow grass is smaller and finer than smooth cordgrass. It grows not only in the salt meadows, but also on sandy beaches that are wet by the tide. Saltmeadow grass produces flowers and fruits along one side of the stalk. The smooth stalk grows to a height of one to two feet. This and blackgrass furnish most of the salt hay along the Atlantic Coast. The grass is not only a source of food for cows, but is also eaten by ducks, geese, and muskrats.

Spikegrass, growing in dense colonies, is found in a variety of places in the salt marsh. It provides nesting cover for waterfowl and is used for food by black ducks and teal. The plant is hairless and the three-inch to two-foot stems rise from a horizontal rootstock. The flower clusters are pale green, thick, and spike-like.

Blackgrass is a small, dark-green rush that is closely related to the lily family. However, instead of the petals of its flowers being showy, they are tiny and scale-like. This plant grows in areas that are frequently wet to areas that are only under water occasionally.

The marsh elder can be found along the high-water mark in the upper portion of the marsh. It has large, coarse leaves and small, greenish-white flowers. Marsh elder plays an important role in sod formation. Its partly woody stems help catch leaves and twigs that eventually become part of the marsh soil.

The shape of glasswort is similar to that of a candleabra. The thick, succulent stems store water, and the plant which is green in the summer turns spectacular shades of orange and red in autumn. The branches are eaten by geese and the seeds are eaten by pintail and scaup. In Colonial times, glasswort was a tasty addition to salad.

Sea lavender is a spray-like plant with many tiny fragrant blue or lavender flowers on a single leafless branching stem. The leaves are thick and grow from the root of the plant. This beautiful marsh plant grows well where there is a high concentration of salt.

The showy yellow flower of seaside goldenrod adds a splash of color to the high marsh in the late summer and early fall. The stout stems are covered with long, smooth, fleshy, leaves. On the lower stem the leaves partly encircle the stem.

THE ROUGH PERIWINKLE is most frequently found in the smooth cordgrass of the low marsh. The shell is rough with irregular raised lines and is yellow-gray or yellow-green in color. Although the periwinkle is a marine snail, it can remain active during long periods of exposure. Unlike other snails, the rough periwinkle carries its eggs in a brood pouch until the young are fully developed and able to meet the demanding conditions of marsh life. This snail feeds on algae and decaying plant material.

The mud snail is abundant on the tidal mud flats of the estuaries bordering the marshes and in muddy tidal creeks and ditches. The shell is cone-shaped and either dark gray, brown, or black in color. Primarily a carnivore, the mud snail locates its food by following a trail of water-borne odors to any dead or decaying organisms.

This small, air-breathing snail is one of the most interesting high marsh animals. Young salt marsh snails have shiny shells that vary in color from light to dark brown, with from one to six bands. The shells of older snails are corroded and rough. Adult salt marsh snails have an air sac and must breathe air. Therefore, they often climb to the top of the salt marsh grasses to escape the incoming tides.

The ribbed mussel, which gets its name from the many radiating ribs on the shell, is abundant in the mud of the low marsh. The color of this two-shelled animal is either dark blue or brownish green. The ribbed mussel must be submerged part of the day in order to feed. The gills sort out suspended particles according to size. The smaller particles go to the esophagus and the larger ones are ejected. The ribbed mussel is not palatable and should not be confused with the blue mussel, which is smooth and blue colored.

THE FIDDLER CRAB IS VERY ABUNDANT in Connecticut tidal marshes. The male has one very large claw which is used during the breeding season to attract the female and to threaten and fight other males. The fiddler crab feeds on algae, bacteria, partially-decomposed marsh grass, animal remains, and worms. The claws scoop mud into the mouth where edible parts are separated from inedible parts.

The common prawn is one of the two species of shrimp found in the tidal creeks and ditches of Connecticut salt marshes. The prawn is clear in color, one inch in length, and has very long antennae. The diet comprises seaweed, smooth cordgrass, and small invertebrates.

The green crab is often found in the tall, smooth cordgrass areas of the low marsh. Color varies from dark green or blue-green to greenish orange. The carapace, or shell, is almost square, with five spines on each side of the front edge. Chiefly a scavenger, the green crab feeds on dead animal material, but will also prey on living animals, such as worms.

The blue crab gets its name from the blue color of its claws. In the summer, blue crab is found in the tidal creeks and ditches, while in the winter it is found off-shore. Its diet includes small, living bi-valves, crabs, live plants, and dead animal material. Blue crab is a favorite food of many people, both when the shell is hard and when soft, immediately after moulting.

THE MUMMICHOG IS A SMALL FISH that grows to only six inches. It abounds in the tidal creeks that cut the salt marshes and in the brackish water at the mouths of streams and rivers. "Mummies," or killifish, are omnivorous, feeding on both animal and vegetable matter.

The menhaden is commonly called a "bunker," or boney fish, and is flattened sideways like all other herring. Juvenile menhaden are often found in estuaries, where they feed on microscopic plants and animals. When they become adults, they travel in schools in open water. Menhaden are among the important commercial fish along the Atlantic Coast. They are used for the manufacture of oil, fertilizer,



The mummichog grows to only six inches and is omnivorous.

poultry feed, and fish bait.

The silverside attains an adult size of about six inches and is found at high tide among the grasses of the salt marsh. Its distinguishing feature is a silver band outlined above a narrow black streak running along each side of the body. The chief function of the silverside is to serve as food for predacious fishes, such as young bluefish, mackerel, and striped bass.

In the late summer months, bluefish provide excellent sportfishing. Because they seem to like warm water (58 to 60 degrees), they are only migrants to our area. Young bluefish, or "snapper blues," are six to eight inches long. "Snappers" feed largely on young, smaller fish in the estuaries and tidal waters. Adult bluefish weigh up to and over 10 pounds, while "snapper blues" weigh from one to two pounds. The teeth of bluefish are extremely sharp and should be approached cautiously. Bluefish are important to us for their food value.

THE NORTHERN DIAMOND-BACK TERRAPIN is a relatively small turtle found in tidal marshes. The head, neck, and legs of this terrapin are gray with black spots, while the color of the shell varies from light brown to black. There are circular ridges on each plate of the shell. Although the terrapin was once very abundant and was hunted commercially for food, its numbers were greatly reduced and now it is protected by law. The diamond-back terrapin feeds

on snails, crabs, worms, insects, and some plant material.

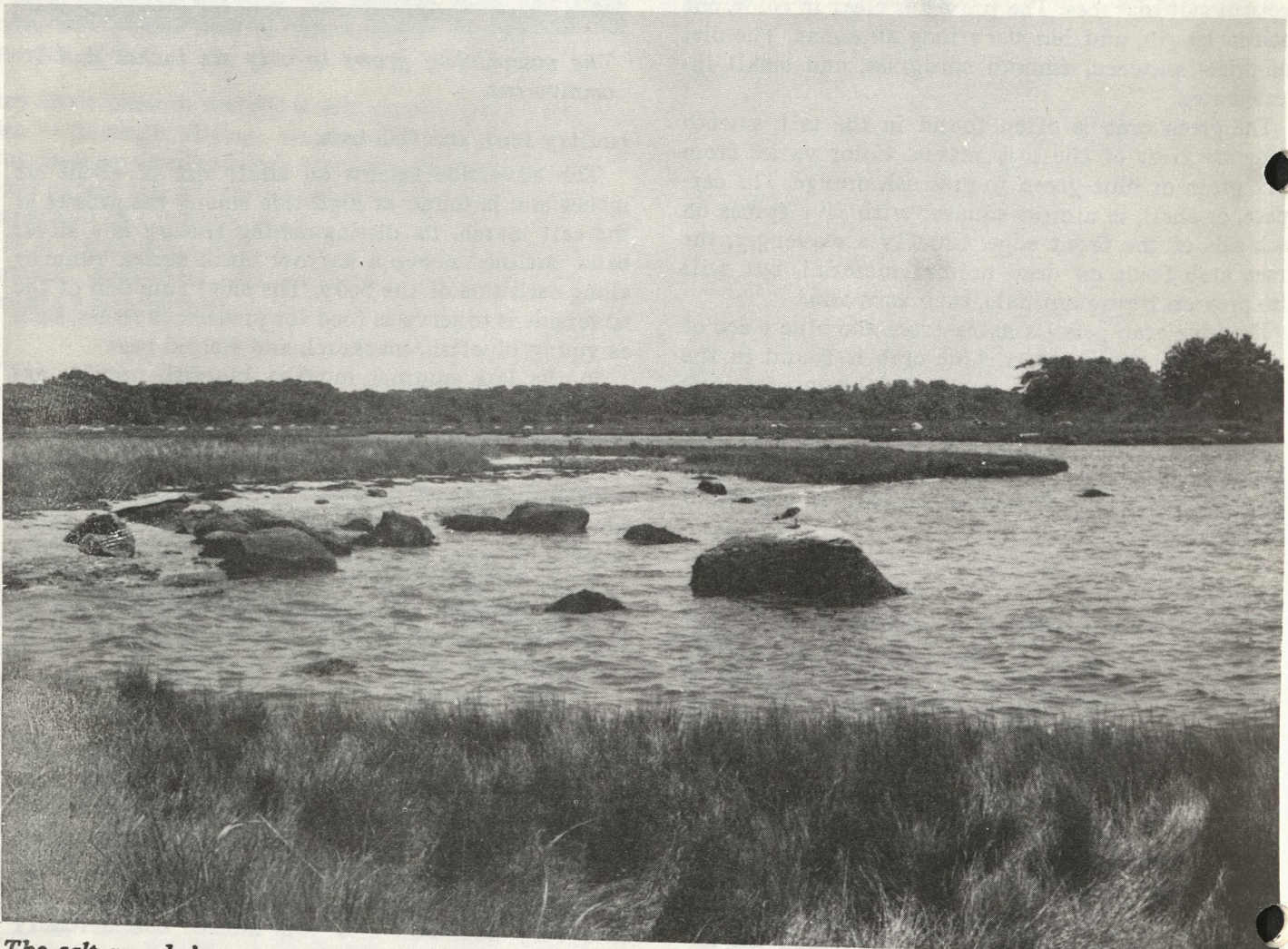
THE SNOWY EGRET IS A COMMON VISITOR to the salt marsh. Its plumage is snow white and it has a black, thin bill which is yellow at the base. The legs are black, and the feet bright yellow. The snowy egret feeds on small invertebrates and fish.

The mute swan is an introduced bird from Europe. Recently, it has begun to thrive on the East Coast of the United States. When swimming, it holds its neck in a graceful "S" curve, with the bill pointed downward. The adult has an orange bill with a black knob. The swan dips its head and neck into the water to feed on bottom vegetation. The mute swan also browses on the marsh grasses.

The herring gull is a frequent sight along the Connecticut coast. A mature herring gull is about 20 inches in length, with black wing tips. The immature gulls have brownish-colored feathers. Primarily a scavenger, the herring gull will also break shelled

animals by dropping them on rocks in order to feed on the exposed flesh. It is commonly seen high overhead, sailing like a hawk.

PEOPLE OFTEN ARE UNAWARE of the ecological importance of the marshes. Salt marshes serve as the nursery grounds for many coastal and marine fishes. It has been theorized that up to 90 percent of the world's edible fish begin life in the shallow coastal waters. Nutrients which play a part in forming the ocean's food cycles have their origin here. Water birds and aquatic animals use the marshes for homes and resting areas. Marshes also play a role in cleansing water and in helping to protect shore areas from flooding. Salt marshes are places of dynamic and diverse life forms, and are critical links in the ecological system. It is to the credit of our state that we have now recognized the value of the salt marshes and our responsibility to preserve and protect them.



The salt marsh is an extraordinarily rich and abundant natural habitat. Since 1914, Connecticut has lost 50 percent of its salt marshes.



At the 4-H Farm Resource Center and Orchard in Bloomfield, children learn that milk comes from a cow, not a wax carton. (Photos: Margaret A. Carter)

Where Does Our Food Really Come From?

by
Alexander Thomas
Environmental Intern

LAST YEAR, the 4-H Farm Resource Center and Orchard, located on Simsbury Road in Bloomfield, was visited by over 10,000 children and adults. And yet, the farm's emphasis on "hands-on activities" has given it a reputation for providing personal, family-oriented educational opportunities.

In the 1950s, "Auer Farm," originally owned by George S. Auerbach, was widely known for its success in the orchard, dairy, and poultry businesses. In 1968, ownership of the farm was transferred to Auerbach's daughters and son-in-law who, since 1976, have donated approximately 120 acres to the Connecticut



Last year, classes from 94 Connecticut schools visited the 4-H Center.

4-H Development Fund.

The Resource Center has put this generous gift to good use in extending community educational programs and providing a pastoral environment to visit.

THE CENTER FEATURES two major events each year, in addition to on-going educational programs for children. Each spring and fall, more than 1,000 visitors participate in seasonal festivals. The "Spring Spectacular" includes outdoor activities such as sheep-shearing, cow-milking, hay rides around the farm, and a large farm animal display. Children can pet the live animals and participate in a variety of educational exhibits.

If the spring festival welcomes warm weather, then the fall festival embraces the apple harvest from the Center's apple orchard. Children pick apples for pay, and make their own cider from a hand press located on the farm grounds. Hay rides and a live animal exhibit are also featured at the fall event.

While these two festivals have been historically very popular, and highlight the Resource Center's role in the community, the varied and extremely well-attended educational programs are the Center's primary function.

In 1986, 348 classes from 94 schools participated in the 90-minute structured programs offered by the

Center. These programs are available from April through November.

"Our goal here is education," says Daniel Krueger, farm manager at the Resource Center. "We show children that carrots come from a garden, not from a can, that milk comes from a cow, not a wax carton."

The Center also serves handicapped children, including those who are learning-disabled and hearing/sight impaired. And, of course, families are always welcome at the Center, where they may enjoy the live animals or just walk around peacefully.

THERE ARE DEDICATED 4-H MEMBERS in virtually every county in the state. Hartford County alone boasts a direct club involvement of 1,100 members, and an outreach total of 17,000. Youngsters participate in "projects" that focus on different areas of agriculture. "Our strongest project is the 4-H Dairy Project," says Edward Merritt, Hartford County extension administrator. "Through this program, children lease — for a nominal fee — a dairy animal from a local farmer. The youngster is given full responsibility for feeding, grooming, and caring for the animal."

In all but one county in the state, children may enter their "project" in 4-H sponsored fairs. There are also poultry projects, in which children raise chickens and capons. Hartford and Litchfield counties are areas of largest participation in an ever-growing and popular program.

For further information on the 4-H Farm Resource Center and Orchard and other 4-H programs, please phone 242-7144.





Creamy the Eastern Milk Snake is one of the more popular residents of the Ansonia Nature and Recreation Center.

Ansonia's Corner of Tranquility

Text and photos by
Margaret A. Carter
 Environmental Intern

A BABY RABBIT OPENS ITS EYES for the first time. Hikers, their reflections shimmering in a pond, meander down a trail which runs through both woods and fields. Children play on grassy fields. Interested observers watch the antics of Lucky the Lobster, Creamy the Eastern Milk Snake, as well as a very active assortment of turtles, snails, and horseshoe crabs.

All of this is taking place at the Ansonia Nature and Recreation Center. The Center provides outdoor recreation, a haven for orphaned and injured wild animals, environmental education, and a nature preserve. All activities and programs are directed toward promoting "a reverence for all life," and "a lasting ethic of environmental stewardship."

The Center is a wonderful place for anyone in-

terested in flora and fauna of Connecticut, or just in experiencing their beauty and diversity first-hand. Located in the northeast corner of Ansonia, the Center comprises 104 acres of woodlands, ponds, streams, and old fields. Two and a half miles of nature trails are used for teaching, study, and exploration. In addition, there is a large building used for indoor instruction and browsing. Two picnic pavilions and baseball and soccer fields are available on a reservation basis.

THE DRIVING FORCE behind this active nature center is Donna Lindgren. Lindgren became the director in 1980, her deep love and respect for nature, her experience with the Connecticut Audubon Society, and her training in environmental education has



Director Donna Lindgren's goal is to encourage an awareness of the natural world.

led the Center to its present level of activity.

Lindgren's main concern is to instill in people, especially children, a respect for and awareness of the natural world. If a person can respect and appreciate a frog, an insect, or a "weed," he or she will then be able to respect all other people and the entire physical world.

Lindgren maintains a few live animals for educational purposes. These animals, however, are supplied from coastal industrial dredging. She will not deliberately remove animals from their natural habitat and accepts them as temporary residents only if their initial removal was unavoidable. And, even then, she only accepts native Connecticut animals so that they can be released or have a chance to survive if they escape. The Center is not a "zoo," but rather a half-way house, the stepping-stone between captivity and a return to the natural world. Once they have recovered, all animals are returned to the wild.

COLLECTING WILD PLANTS OR ANIMALS is not allowed on the Center's land. People are discouraged from ever taking natural organisms from their natural habitat. The Ansonia Nature and Recreation Center is a place for Connecticut plants and

wildlife to live undisturbed, and for the natural life cycles and processes to be observed.

In an effort to protect the natural ecosystem in her area, Lindgren had to convince the City of Ansonia to reduce mowing operations. Under Lindgren's direction, however, only the minimum amount of grassland is now mowed, while the rest is allowed to grow up naturally.

LINDGREN SPONSORS many community projects. She runs a junior ranger program for 9-13 year olds, and teaches 7-14 year olds to plant, weed, water, and harvest their own garden plots. Adults are also allowed to garden individual plots. The Ansonia Garden Club maintains wildflowers and ferns around the interpretive building. In addition, Lindgren plans two informative and seasonal community programs a month, such as skywatches infused with Native American folklore, wildflower and tree identification, day camps for children during school vacations, seminars on insects, maple syruping, mushrooming, wild edible plants, and cross-country skiing. She also conducts similar programs for local schools.

For further information, contact Donna Lindgren, Director, Ansonia Nature and Recreation Center, 10 Deerfield Lane, Ansonia, CT 06401. Phone: (203) 736-9360.



The Ansonia Nature Center is a wonderful place to experience natural diversity first hand.

Nature's Master Builder

Text and Photos by
Carl W. Rettenmeyer
 Director
 Connecticut State Museum
 of Natural History

The expression "to stir up a hornet's nest" creates an image of strife and hostile behavior. That expression began probably with some small boy piking a stick into a hornet's nest.

From the hornet's point of view, it is only defending its nest, the queen, and young ones from death and destruction. In fact, the bald-faced hornet, the most common hornet in Connecticut, is not aggressive and seldom attacks unless provoked.

Bald-faced hornets are black and white relatives of the smaller yellowjacket wasps. They construct nests of wood fibers scraped from fence posts or other sources of dead wood. Each nest is started by a single queen in early spring, reaching maximum size by fall. Often nests are not visible until the leaves drop.

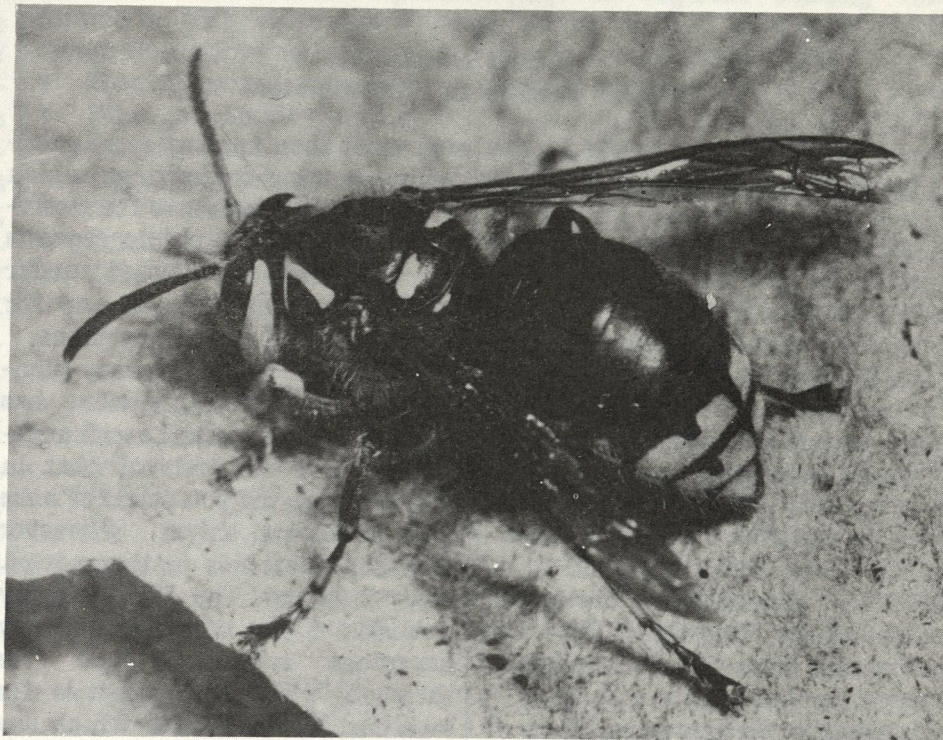
The wasps eat thousands of insects during the summer and are important predators of house flies. Because of this, these hornets are considered beneficial.

The nests of bald-faced hornets are architectural masterpieces, products of genetic blueprints which have evolved over millions of years. The queen who starts the nest has never built any part of a nest in her life. The female workers, never having seen a nest before, are somehow able to build one with the exact characteristic shape and gray color of the species, usually measuring 18 inches across and 20 inches high.

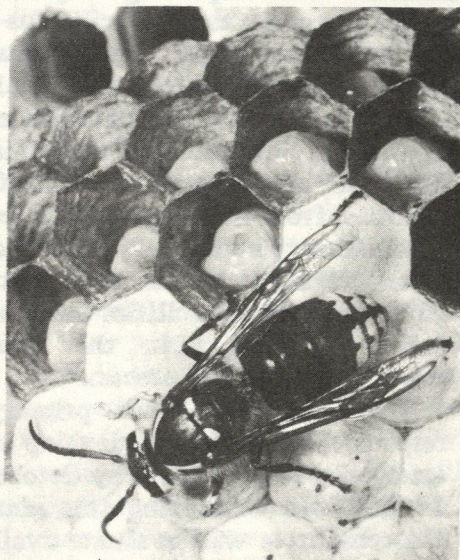
Because of their size and impressive construction, these nests are

commonly collected for use as home decorations. Collecting or destroying the nests early in the summer is not recommended, as the wasps are

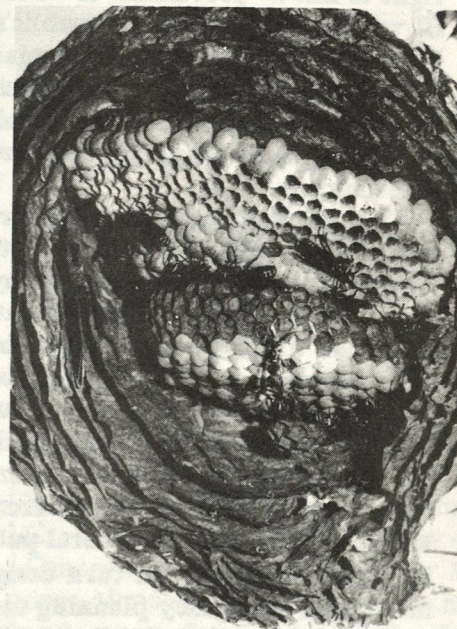
considered beneficial. Collection should be done in the fall, after several hard frosts, when the wasps are dead or have left the nest. ■



Female worker on outside of nest made of wood fibers. People discovered by observing wasps that paper could be made from wood fibers.



Close-up of male walking on silk caps spun by mature wasp larvae in cells of comb. Younger larvae at the bottom are still being fed by the adult workers, all of which are female.



Five to 10 paper envelopes around the combs provide strength and insulation from the sun.

Superfund Amendments to Take Effect

by

Leslie Lewis

Citizens' Participation Coordinator

On October 17, 1986, the "Superfund Amendments and Reauthorization Act of 1986" (SARA) was enacted into law. One part of the new SARA provisions is Title III: the Emergency Planning and Community Right-to-Know Act of 1986. Title III establishes requirements for federal, state, and local governments and industry regarding emergency planning and 'community right-to-know' reporting on hazardous and toxic chemicals. This legislation builds on EPA's Chemical Emergency Preparedness Program (CEEP) and numerous state and local programs aimed at helping communities to better meet their responsibilities in regard to potential chemical emergencies. The community right-to-know provisions of Title III will help to increase the public's knowledge and access to information on the presence of hazardous chemicals in their communities and releases of these chemicals into the environment.

Title III requires that the governor of each state designate a state emergency response commission by April 17 of 1987. In Connecticut, Governor O'Neill established the commission on April 14. It comprises representatives of the various state agencies involved with public health, public safety, and the environment, as well as people from business, labor, and the general public. This commission in turn designated local emergency planning districts; in this case each of the 169 towns in the state is a district, but towns may group together into regions if they choose. The commis-

sion must then appoint local emergency planning committees, which will establish procedures for receiving and processing public requests for information collected under other sections of Title III and for reviewing local emergency plans.

Why all of this emergency planning? Although Connecticut has never had an industrial accident remotely near the scale of that in Bhopal, India, the potential for some type of mishap exists wherever hazardous materials are transported, used, or stored. The EPA recently published a list of 402 extremely hazardous substances and the threshold planning quantities for each one; local facilities which use, store, or produce these substances must report this to state and local officials. This reporting requirement also applies to any facility using materials safety data sheets (MSDS) under federal Occupational Safety and Health Administration regulations. In Connecticut, this law could affect as many as 6000 facilities, from metal plating shops to community swimming pools and water treatment plants. Representatives from these facilities must be active participants in the local emergency planning process.

The local committee's primary responsibility will be to develop an emergency response plan by October 17, 1987. In developing this plan, the committee will evaluate available resources for preparing for and responding to a potential chemical accident. The plan must include:

Identification of facilities and extremely hazardous substances

transportation routes;

Emergency response procedures on-site and off-site;

Designation of a community coordinator and facility coordinator(s) to implement the plan;

Emergency notification procedures;

Methods for determining the occurrence of a release and the probable affected area and population;

Description of community and industry emergency equipment and facilities and the identity of persons responsible for them;

Evacuation plans;

Description and schedules of training program for emergency response personnel;

Methods and schedules for exercising emergency response plans.

This emergency planning may look like a lot of wasted time and energy to those who think that a chemical emergency "can't happen here in my town." The truth is, however, that an emergency can occur any place, at any time. A planned, coordinated response to that emergency can reduce potential property losses, and more important, can save lives. If you are interested in finding out more about your local emergency planning committee, contact your chief elected official's office. For more information about the SARA provisions in general, contact Charles Zieminski at the DEP Oil and Chemical Spills Section, Hazardous Materials Management Unit, State Office Building, Hartford, CT 06106 or call 566-4633.

The Bulletin Board

New from the DEP

The DEP's Natural Resources Center and Bureau of Fisheries announce that the 1987 *Guide to Lakes and Ponds of Connecticut: Interim Report* is now available. This 85-page document contains maps and information on 73 of Connecticut's lakes and ponds. For each waterbody, there is a map of the bottom contours (bathymetry) and a listing of fish types, boat launch locations, information on access, fishing regulations, and on-site parking conditions.

Copies of the *Guide* may be obtained from the Natural Resources Center, Publication Sales, Room 555, 165 Capitol Ave., Hartford 06106. Phone: (203) 566-7719. The cost is \$4.65 per copy, \$2.00 handling, and Connecticut residents must add 35 cents sales tax.

The new *Farmington River Basin Report*, prepared by the U.S. Geological Survey in fiscal cooperation with the DEP, is now available. The report area of 435 square miles includes the Farmington River basin in Connecticut upstream of Tariffville. All or parts of 19 towns are within the area. The authors, E.H. Handman, F. P. Haeni, and M.P. Thomas, describe the water resources of the area in the 91-page report, which includes 53 illustrations, 30 tables, and four separate maps.

Copies of this report may be obtained from the DEP Natural Resources Center, Publication Sales, Room 555, 165 Capitol Ave., Hartford 06106. Phone: (203) 566-7719. The cost is \$15.00 per copy, \$2.00 for handling, and Connecticut residents must add \$1.13 sales tax.

The Hazardous Waste Management Section has a show which is available for Small Quantity Generators (SQGs) of hazardous waste. It is available either in a slide/tape show format or VHS video cassette, and covers the following topics:

- What is hazardous waste?
- What is a Small Quantity Generator?
- Regulatory requirements (state and federal).
- Common sense recommendations for hazardous waste management.
- What trade associations can do to develop a partnership.
- Waste reduction options.
- Examples of mismanagement of hazardous waste.

To borrow the show, contact: Ms. Darlene Sage, Hazardous Waste Management Section, 122 Washington Street, Hartford 06106, (203) 566-5019/8843.

Seedling Offer

State forester Robert L. Garrepy announced that orders for tree and shrub seedlings are now being accepted for the 1988 spring planting season. Orders should be placed as soon as possible because some species sell out very quickly. All seedlings will be shipped in late March or early April to pick-up points throughout the state. Landowners will be notified by postcard when the order may be picked up.

Two programs are available. This first is the *Wildlife Habitat Package*, which comprises 50 tree seedlings (25 hemlock and 25 Norway spruce) and 50 shrubs (25 silky dogwood and 25 autumn olive). At least one quarter-acre of plantable land is needed to qualify for the program. The packet costs \$20.00, including delivery to a pick-up point.

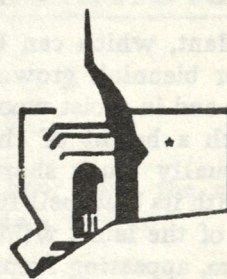
The second program, *Forest Planting Stock*, is available to Con-

necticut landowners with larger planting areas, who intend to establish a forest plantation, develop a commercial Christmas tree planting, to augment existing forest stands, or who have other specific conservation needs. *Forest Planting Stock* orders for conifer species must be in multiples of 250. The price is \$19.00 per 250 seedlings, or \$76.00 per thousand. These orders require approval of a service forester, who may inspect the planting area.

All orders are restricted in that they cannot be resold with roots attached, nor be used for ornamental planting.

For order forms, call or write one of the following offices: State Forester's Office, 165 Capitol Ave., Hartford 06106, 566-5348; Western District Headquarters, 230 Plymouth Road, Harwinton 06791, 485-0226; Eastern District Headquarters, 209 Hebron Road, Marlborough 06447, 295-9523; or Pachaug State Forest Nursery, RFD #1, Box 23A, Voluntown 06384, 376-2513.

Natural History Museum



The Connecticut State Museum of Natural History is expanding its hours. The Museum in the Wilbur Cross Building at The University of Connecticut at Storrs will now be open Mondays from noon to 4 p.m., and every Saturday and Sunday from 1:00 to 4 p.m. The exhibits in the Wilbur Cross Building include the finest collection of hawks and

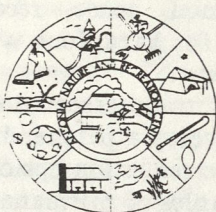
owls in New England, Indian artifacts, minerals, and shells. The exhibit of sharks in the Jorgensen Building at UConn, with the largest shark on display in the United States, is open Monday through Friday from 8:00 a.m. to 4 p.m., and every Saturday and Sunday from 1:00 to 4 p.m. For further information, call 486-4460. ■

Trout Prints

We have received many requests in regard to the drawings of trout which appeared in the April *Bulletin*. Prints of these original illustrations by Dan Landrie may be ob-

tained by sending a \$20 contribution to the "Turn in Poacher" Program, Connecticut Wildlife Federation, 27 Washington St., Middletown 06457. All proceeds will benefit the TIP program. ■

Ansonia Nature Center



The Ansonia Nature and Recreation Center, on Deerfield Road in Ansonia, announces the following up-coming events:

Saturday, September 19, 1:30 p.m. *Garden Patch Open House*. Displays of results of summer gardening.

Saturday, September 19, 2:00 p.m. *All About Insects*. Meeting some of our insect neighbors, with a game of Insect Bingo.

Friday, October 30, 6:30 p.m. *Halloween Owls*. A night field trip. Register in advance.

All programs are open to the public. Children must be accompanied by an adult. For further information, phone 736-9960. ■

Trailside Botanizer

by
Gale W. Carter
Illustration by
Pam Carter

The Eastern fringed gentian (*Gentiana crinita*) is one of the most beautiful and exquisite of our native wild flowers. Its color, rarity, and blooming time are all features that combine to make this flower special.

This plant, which can be either annual or biennial, grows in wet meadows and in moist woodland. It may reach a height of three feet, but is usually much shorter. This species with its blue, bell-like flower is one of the latest wild flowers to blossom, appearing from August to as late as November. The flower is arranged singly on long stalks. It has four petals that are fringed with hairs at their tips, which help to keep away crawling insects. In order to protect its pollen from getting wet, the petals close when the weather is cloudy or wet. Even a

cloud drifting by may cause the petals to close.

The leaves are oval to lance-shaped and are opposite. There are no teeth on the margin of the leaf. The species name *crinita* is a Latin word meaning "hairy," a reference to the delicate hairs that are on the outer edge of the petals.

It is believed that the common and generic name for the fringed gentian originated from Gentius,

King of Illyria. He is thought to have discovered some of the plant's medicinal values.

A solution from the root of fringed gentian was thought to be useful as a spring tonic to help the appetite, improve digestion, and purify the blood. It was also used by the Indians for back pain.

There are more than 50 species of gentian in the United States and in Europe. Many have been cultivated for use in gardens. Fringed gentian can be grown from seeds but is quite hard to establish; once it is established, however, it will persist. Good results have been reported when the seeds were planted in soil from under cedars. This may be due to the presence of favorable soil fungi (mycorrhizae). ■



Correction noted: In the article describing the bracken fern in the June Citizens' Bulletin, an error occurred, which should have read as follows: The bracken fern often appears in large colonies and is considered a weed species. We regret the error. Ed.

The Night Sky

by
Francine Jackson

Usually, when introducing the night sky, astronomers tend to concentrate on the seasonal constellations, the ever-changing sky to the south. But, if you turn around, and look toward north, you'll find two of the most mythologically-rich star patterns in the heavens: Ursa Major and Ursa Minor, the Big and Little Bears. With our far-from-dark skies, the idea of two bears up there might be a little tough to imagine, but almost everyone can at least discern the seven stars of the Big Dipper, not a constellation in itself, but an asterism, a small part of the Big Bear. Legend has the "pan" as the bear's lower back, and the "handle" as the bear's long, fluffy tail. Long fluffy tail?

The Greeks and Romans had several different stories to explain this ursine oddity, depending on the age of the audience. One involves the god Jupiter (or Zeus), a far-from-faithful husband, who became romantically involved with

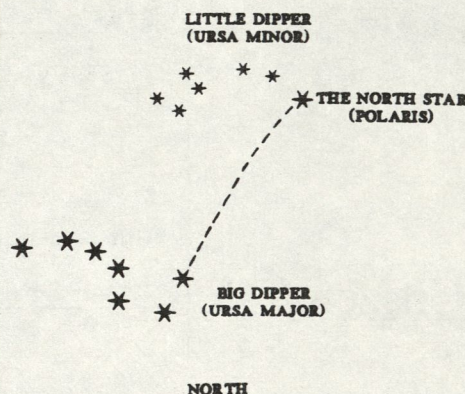
the beautiful maiden, Callisto. Upon the birth of Callisto's son, Arcas, Jupiter's wife Juno (or Hera) couldn't help but notice the family resemblance and, in a fit of jealousy, changed Callisto into a big ugly brown bear.

Several years later, the now mature and handsome Arcas was in the woods on a hunt. Callisto instantly recognized her son and ran to greet him, forgetting for a moment that she was a big ugly brown bear. In this mode, Arcas saw not maternal love but certain

death, and accurately aimed his bow and arrow. Luckily, Jupiter happened to witness this scenario and, driven by pity for Callisto, transformed Arcas into a bear, grabbed both by the tails, and swung them into the heavens, where they landed amidst the stars. The immense swinging action caused their normally stubby little tails to stretch into the beautiful fluffy tails we still see today.

At this time of year, finding the whole Big Bear is a little hard; most of it is below the horizon. The Big Dipper, however, is always visible, and right now is just grazing our northern landscape. Once found, look for the two stars at the edge of the pan furthest from the handle. They point directly to Polaris, also called our North Star, and the one at the end of the Little Bear's tail (or the Little Dipper's handle). You're now seeing both mother and son.

A reminder: Autumn begins Wednesday, September 23 at 9:45 a.m. EST. On that day, look for the sun to rise and set almost due east and west, respectively. ■



Letters to the Editor

I enjoy reading the *Bulletin*. It is not only informative with regard to the subject material, but it gives me insight into the DEP, its workings, and its people.

John C. Robinson, M.D.
Glastonbury

We love your *Bulletin* — especially info about local fauna and flora and news of upcoming events, like the Indian powwow. The price is incredible.

Pamela Wheeler
South Wellington

Let's ship a few beavers out of Connecticut.

Nancy Hawley Wilson
Kent

We enjoy the *Bulletin*. You should send out notices before Christmas for gift subscriptions.

Carl W. Anderson
Manchester

Good idea. We hope in the October issue to make our readers an offer they can't refuse. Ed.

Endnote

"You now have the need to live like a warrior."

Carlos Castaneda



What's that? The Citizens'
Bulletin? On time?

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